Form: PTO/SB/17 (Modified)

REPLY/AMENDMENT FEE TRANSMITTAL

Attorney Docket No.	95-333
Application Number	09/496,212
Filing Date	February 1, 2000
First Named Inventor	VISWANATH
Group Art Unit	2665
Examiner Name	RYMAN, Daniel

AMOUNT ENCLOSED	$ 0

FEE CALCULATION (fees effective 10/01/2001)

CLAIMS AS AMENDED	Claims Remaining After Amendment	Highest Number Previously Paid For	Number Extra	Rate	Calculations
TOTAL CLAIMS	18	20	0 (3)	X $18.00 =	$0
INDEPENDENT CLAIMS	3	3	0	X $84.00 =	$0

Since an Official Action set an original due date of____, petition is hereby made for an extension to cover the date this reply is filed for which the requisite fee is enclosed (1 month ($110); 2 months ($400); 3 months ($920); 4 months ($1,440); 5 months ($1,960)):	
If Statutory Disclaimer under Rule 20(d) is enclosed, add fee ($110)	+ $0
Total of above Calculations =	$0
Reduction by 50% for filing by small entity (37 CFR 1.9, 1.27 & 1.28)	-
TOTAL FEES DUE =	$0

(1) If entry (1) is less than entry (2), entry (3) is "0".
(2) If entry (2) is less than 20, change entry (2) to "20".
(4) If entry (4) is less than entry (5), entry (6) is "0".
(5) If entry (5) is less than 3, change entry (5) to "3".

METHOD OF PAYMENT

[ ] Check enclosed as payment.

[ ] Charge "TOTAL FEES DUE" to the Deposit Account No., below.

AUTHORIZATION

[X] If the above-noted "AMOUNT ENCLOSED" is not correct, the Commissioner is hereby authorized to credit any overpayment or charge any additional fees under 37 CFR 1.16 or 1.17 necessary to maintain pendency of the present application to:

Deposit Account No.:	50-0687
OrderNo.: (Client/Matter)	95-333

SUBMITTED BY: MANELLI DENISON & SELTER PLLC

Typed Name	Leon R. Turkevich	Reg. No.	34,035
Signature		Date	January 8, 2004

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Response
1-14-04
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Docket No.: 95-333 PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of	:	
VISWANATH et al.	:	
Serial No.: 09/496,212	:	Group Art Unit: 2665
Filed: February 1, 2000	:	Examiner: Ryman, Daniel J.

For: ARRANGEMENT FOR SEARCHING PACKET POLICIES USING MULTI-KEY HASH SEARCHES IN A NETWORK SWITCH

RESPONSE

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In response to the non-final Official Action mailed October 8, 2003, Applicant hereby submits the following remarks.

Reconsideration and allowance of the above-referenced application are respectfully requested. Claims 1-3 and 5-19 are unchanged and remain pending in the application.

Applicant again requests acknowledgement of the formal drawings submitted April 16, 2001 and the Drawing Change Authorization Request submitted April 29, 2003.

Claims 1-3, and 5-8 stand rejected under §103 in view of U.S. Patent No. 6,243,667 to Kerr et al. in view of U.S. Patent No. 6,091,725 to Cheriton et al. This rejection is respectfully traversed.

As admitted in the Official Action, Kerr et al "does not expressly disclose generating first and second hash keys according to a prescribed hash function in response to first and second information within the received data packet, respectively, or combining the first and second hash

keys according to a prescribed combination into a signature for the received data packet." Moreover, Kerr et al teaches away from claim 1 (and claims 11 and 16) by generating a single hash key based on the source and destination addresses, source and destination ports, and protocol type.

Further, Kerr et al neither discloses nor suggests a network switch, as claimed, but rather discloses a router 140. As described in the Background of the Invention and Cheriton et al (see below), a router is distinct from a network switch.

Cheriton et al discloses a network switch that generates a virtual path cache index 632 in order to identify layer 2 datagram packets as separate flows based on layer 2 source-destination address pairs. Note that Cheriton et al also distinguishes between routers and network switches (col. 3, lines 45-62), specifying that datagrams at the datagram packet layer provide packet switching using a media access control (MAC) protocol such as Ethernet (see col. 2, line 3 to col. 3, line 9; col. 6, lines 8-14 and 41- 53) (i.e., a "layer 2" protocol); in contrast, routers operate primarily at the network protocol layer, rather than the datagram packet layer (col. 3, lines 56-58).

Cheriton et al also specifies that the source-destination address pair from the layer 2 datagram is hashed, as illustrated in Figure 7, in order to provide a virtual path cache index 632 (col. 9, lines 48-60).

Hence, the Official Action fails to make a prima facia case of obviousness, because the hypothetical combination neither discloses nor suggests the claimed feature of "generating first and second hash keys according to a prescribed hash function in response to first and second layer 3 information", as claimed. As described above, Kerr et al generates a single hash key based on the source and destination addresses, source and destination ports, and protocol type, and Cheriton et al generates a single hash key based on layer 2 information. Hence, the hypothetical combination

with provide no more than (1) a first hash key based on the source/destination addresses, ports and protocol type, and (2) a second hash key based on layer 2 information.

Further, the assertion of obviousness fails to address the claimed feature of generating first and second hash keys in response to first and second layer 3 information:

> [i]t would have been obvious ... to generate first and second hash keys according to a prescribed hash function in response to first and second information within the received data packet, respectively and combine the first and second hash keys according to a prescribed combination into a signature for the received data packet in order to have a hash key that is fast and easy to implement.

As shown above, the rejection fails to address the claimed feature that the first and second hash keys are generated in response to first and second layer 3 information within the received data packet. Further, the assertion of having a hash key that is "fast and easy to implement" is subjective, arbitrary and without foundation: there is no evidence that one having ordinary skill in the art would have been motivated to combine the layer 3-based hash key of Kerr et al with the layer 2-based hash key of Cheriton et al, as asserted. To the contrary, one having ordinary skill in the art would avoid the hypothetical combination of a layer 3-based hash key with a layer 2-based hash key, since the hypothetical combination would dramatically complicate indexing and storage requirements for the address table, which would be required to handle storage multidimensional mapping between layer 2 and layer 3 addresses.

Hence, the hypothetical combination also would neither disclose nor suggest the claimed "searching a table configured for storing layer 3 signatures that index respective layer 3 switching entries", since the hypothetical combination would most likely consist of a single layer 2 hash key and a single layer 3 hash key used to access respective layer 2 and layer 3 address tables.

For these and other reasons, the rejection of claims 1-3 and 5-8 should be withdrawn.

Claim 9 stands rejected under §103(a) in view of Kerr, Cheriton et al,, U.S. Patent No. 5,949,786 to Bellenger, and U.S. Patent No. 5,640,399 to Rostoker. It is believed claim 9 is allowable in view of its dependency from claims 1 and 7.

Claim 10 stands rejected under §103(a) in view of Kerr, Cheriton et al., and U.S. Patent No. 6,118,760 to Zaumen. This rejection is respectfully traversed.

The Official Action takes an unreasonable interpretation of the claim language "an identifier specifying the selected layer 3 switching entry", asserting that the claimed term "could be anything, including a packet, a header of the packet, or the hash values, that could be used to identify the switching entry." This tortured interpretation is entirely without foundation and is unreasonable because it is inconsistent with the specification. In particular, page 6, lines 20-25 of the specification states:

> The layer 3 switching entries are stored in addresses that are a function of the corresponding entry signature, hence the network switch port 20 can identify the selected layer 3 switching entry that should be used for layer 3 switching decisions based on a match between the corresponding entry signature and the packet signature. The network switch port 20 can then forward the identification of the selected layer 3 switching entry to the switch fabric 25 for execution of the corresponding layer 3 switching decision.

The specification also specifies on page 7, lines 21-24 that:

> In particular, the signature table 46 within the network switch 12 stores the addresses of the layer 3 switching entries within the policy table 28b, and a corresponding entry signature.

The specification also specifies on page 9, lines 14-17 that:

The flow module 44 and forwards the identified entry (e.g., by forwarding the address value) to the switching logic 25 enabling the layer 3 switching logic to execute the layer 3 switching decision that corresponds to the identified layer 3 switching entry matching the data packet.

Hence, the specification demonstrates that the claimed "identifier" refers to a memory address (or index thereof) to the claimed "selected layer 3 switching entry." The broadest reasonable interpretation cannot be inconsistent with the specification. Hence, "claims are not to be read in a vacuum, and limitations therein are to be interpreted in light of the specification in giving them their 'broadest reasonable interpretation.'" MPEP § 2111.01 at 2100-37 (Rev. 1, Feb. 2000) (quoting In re Marosi, 218 USPQ 289, 292 (Fed. Cir. 1983)(emphasis in original)).

The assertion that the claimed identifier could be a network address, a header, or a packet is both without foundation and inconsistent with the description in the specification that the identifier is used for "specifying the selected layer 3 switching entry" for use by the switching logic in accessing the selected layer 3 switching entry. Moreover, the assertion that the claimed the data for could be a network address would eviscerate the entire purpose of performing the layer 3-based hashing in the network switch port, as described for example at page 2, lines 22-34 of the specification.

As such, Zaumen neither discloses nor suggests forwarding an identifier specifying the selected layer 3 switching entry, especially from the network switching port having received the data packet to the layer 3 switching logic. Rather, Figure 1 shows that each subsystem (e.g, 110, 120) is configured for serving multiple links, and thus cannot be considered a network port, as claimed. Each subsystem includes a switching element 111, a fowarding memory 113, and an associated memory 114. Hence, identification of a switching element does not occur until after

the input network switch port forwards the received data packet to the switching element (see, e.g., col. 5, lines 44-46).

Hence, the hypothetical combination neither discloses nor suggests that the network switch port forwards the "identifier specifying the selected layer 3 switching entry... to layer 3 switching logic", as claimed. For these and other reasons, the rejection of claim 10 should be withdrawn.

Claims 11, 14, and 15 stand rejected under §103(a) in view of Kerr and Zaumen. This rejection is respectfully traversed. The comments above regarding the respective references are incorporated herein by reference.

As argued above, Kerr does not disclose an integrated network switch, as claimed. As clear from the specification, the term "integrated" refers to integration on a single chip. In contrast, Kerr discloses a router, and not an integrated network switch. As described above, a network switch and a router are distinct network devices configured for performing different network operations. One having ordinary skill in the art would not equate a router with an integrated network switch.

As described above, Zaumen et al. neither discloses no suggests generating a packet signature by a network port based on performing the prescribed hash operation on the first and second portions of the layer 3 information, as claimed. Rather, Zaumen et al. explicitly teaches away from this feature by specifying any packet processing is performed centrally, and not at the network port:

> a newly arrived packet at the subsystem 110 will be processed by a hardware class filter in the switching element 111 which identifies the packet as a member of one of several

predefined packet types. The packet's headers are then evaluated against the entries in the forwarding memory 113 that are of the identified class. A matching entry will have one or more subsystem ports identified in the associated memory 114 as well as a certain QOS.

(Col. 5, lines 43-50).

Hence, the teachings of Zaumen et al. are explicitly contrary to the assertions of the Official Action.

Hence, the hypothetical combination of Kerr et al. and Zaumen et al. still would neither disclose nor suggest the claimed generating a packet signature by a network port for a data packet at the network port based on performing the prescribed hash operation on the first and second portions of the layer 3 information, as claimed. For these and other reasons, the §103 rejection of claims 11, 14, and15 should be withdrawn.

Claims 12, 13, and 16-18 stand rejected under §103 in view of Kerr et al., Zaumen et al., and Cheriton et al. This rejection is respectfully traversed. The arguments above are incorporated herein by reference. As described above, Cheriton discloses hashing layer 2 information, and not layer 3 information, as claimed. One having ordinary skill in the art would not been motivated to combine the references, as asserted, especially since the assertion of obviousness is without foundation as described above with respect to claim 1.

Regardless, the hypothetical combination still neither disclose nor suggests combining the first and second hash keys to form and entry signature. In fact, none of the applied references, singly or in combination, disclose or suggest combining two hash keys to form an entry signature, as claimed. For these and other reasons, claims 12, 13, and 16-18 are allowable over the applied prior art, hence the rejection should be withdrawn.

Claim 19 is rejected in view of Kerr et al., Zaumen et al., Cheriton et al., Bellenger, and Rostoker et al. It is believed this depenendent claim is allowable in view of the foregoing.

In view of the above, it is believed this application is in condition for allowance, and such a Notice is respectfully solicited.

To the extent necessary, Applicant petitions for an extension of time under 37 C.F.R. 1.136. Please charge any shortage in fees due in connection with the filing of this paper, including any missing or insufficient fees under 37 C.F.R. 1.17(a), to Deposit Account No. 50-0687, under Order No. 95-333, and please credit any excess fees to such deposit account.

Respectfully submitted,

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Date: January 8, 2004